What is claimed is:

1. A method of manufacturing a thin film transistor device, comprising the steps of:

forming a semiconductor layer having a predetermined configuration on a substrate;

forming a gate insulation film on the semiconductor layer;

forming a metal thin film on the gate insulation film;

patterning the metal thin film so as to remove the metal thin film on the semiconductor layer in regions to become source and drain regions of a thin film transistor of a first conductivity type;

forming the source and drain regions of the thin film transistor of the first conductivity type by implanting an impurity of the first conductivity type in the semiconductor layer using the patterned metal thin film as a mask;

forming a gate electrode of the thin film transistor of the first conductivity type by patterning the patterned metal thin film further; and

forming a low density impurity region between the source and drain regions and a channel region of the thin film transistor of the first conductivity type by implanting an impurity of the first conductivity type in the semiconductor layer using the gate electrode of the thin film transistor of the first conductivity type as a mask.

2. A method of manufacturing a thin film transistor device according to claim 1, comprising the steps of:

forming a gate electrode of a thin film transistor of a second conductivity type at the same time when the gate electrode of the thin film transistor of the first conductivity type is formed;

forming a resist mask such that it covers the thin film transistor of the first conductivity type and thereafter forming source and drain regions of the thin film transistor of the second conductivity type by implanting an impurity of a second conductivity type in the semiconductor layer; and

activating the impurities of the first and second conductivity types after removing the resist mask.

3. A method of manufacturing a thin film transistor device according to claim 2, comprising the step of:

forming the low density impurity region by implanting the impurity of the first conductivity type after removing the resist mask.

4. A method of manufacturing a thin film transistor device according to claim 1, wherein the step of forming the gate electrode of the thin film transistor of the first conductivity type and/or the second conductivity type includes the step of covering the gate electrode of the thin film transistor of the first conductivity type with a resist mask at which the low density

impurity region is not to be formed, thereby preventing the same from being etched.

5. A thin film transistor device comprising:

a first thin film transistor of a first conductivity type including a semiconductor layer formed on a substrate, a first gate insulation film formed on the semiconductor layer, a second gate insulation film formed on the first gate insulation film, and a first gate electrode formed on the second gate insulation film, a low density impurity region being formed between source and drain regions and a channel region of the semiconductor layer; and

a second thin film transistor including the semiconductor layer, the first gate insulation film, a second gate electrode formed on the first gate insulation film, and an insulation film that is formed on the second gate electrode and that is formed of the same material of which the second gate insulation film is formed.

6. A thin film transistor device according to claim 5, further comprising:

a third thin film transistor of the second conductivity type including the semiconductor layer, the first gate insulation film, the second gate insulation film, and the first gate electrode.

7. A substrate for a thin film transistor, comprising a plurality of bus lines formed on a substrate such that they intersect each other with an insulation film interposed, pixel regions provided in the form of a matrix in a display area on the substrate, and a thin film transistor device formed at a peripheral circuit provided around the display area, wherein the thin film transistor device is a thin film transistor device according to claim 5.

8. A display comprising a substrate having a thin film transistor as a switching element, wherein a substrate for a thin film transistor according to claim 7 is used as the substrate.

9. A method of manufacturing a thin film transistor device, comprising the steps of:

forming a semiconductor layer having a predetermined configuration on a substrate;

forming a first gate insulation film of first and second thin film transistors on the semiconductor layer;

forming a first metal thin film on the first gate insulation film;

forming a gate electrode of the first thin film transistor by patterning the first metal thin film;

forming a second gate insulation film of the second thin film transistor on the gate electrode of the first thin film transistor;

forming a second metal thin film on the second gate insulation film;

patterning the second metal thin film so as to remove the second metal thin film on the first thin film transistor and on the semiconductor layer in regions to become source and drain regions of the second thin film transistor;

forming the source and drain regions of the first and second thin film transistors by implanting an impurity of a first conductivity type in the semiconductor layer using the gate electrode of the first thin film transistor and the patterned second metal thin film as masks;

forming a gate electrode of the second thin film transistor by patterning the patterned second metal thin film further; and

forming a low density impurity region between the source and drain regions and a channel region of the second thin film transistor by implanting the impurity of the first conductivity type in the semiconductor layer using the gate electrode of the second thin film transistor as a mask.

10. A method of manufacturing a thin film transistor device according to claim 9, comprising the steps of:

forming a gate electrode of a third thin film transistor at the same time when the gate electrode of the first thin film transistor is formed;

forming a gate electrode of a fourth thin film transistor

at the same time when the gate electrode of the second thin film transistor is formed;

forming a resist mask such that it covers the first and second thin film transistors;

forming source and drain regions of the third and fourth thin film transistors by implanting an impurity of a second conductivity type in the semiconductor layer using the resist mask and the gate electrodes of the third and fourth thin film transistors as masks; and

activating the impurities of the first and second conductivity types after removing the resist mask.

11. A method of manufacturing a thin film transistor device according to claim 10, comprising the step of:

removing the second metal thin film on the third thin film transistor at the same time when the gate electrodes of the second and fourth thin film transistors are formed.

12. A method of manufacturing a thin film transistor device according to claim 10, comprising the step of:

forming the low density impurity region of the second thin film transistor after removing the resist mask.

13. A method of manufacturing a thin film transistor device according to claim 10, wherein the step of forming the gate electrode of the second and/or fourth thin film transistor

includes the step of covering the gate electrode of the second thin film transistor with a resist mask at which the low density impurity region is not to be formed, thereby preventing the same from being etched.

14. A method of manufacturing a thin film transistor device, comprising the steps of:

forming a semiconductor layer having a predetermined configuration on a substrate;

forming a first gate insulation film of first and second thin film transistors on the semiconductor layer;

forming a first metal thin film on the first gate insulation film;

forming a gate electrode of the first thin film transistor by patterning the first metal thin film;

forming a second gate insulation film of the second thin film transistor on the gate electrode of the first thin film transistor;

forming a second metal thin film on the second gate insulation film;

forming a first resist mask on the second metal thin film;

patterning the second metal thin film so as to remove the second metal thin film on the first thin film transistor and on the semiconductor layer in regions to become source and drain regions of the second thin film transistor by using the first resist mask;

processing the patterned second metal thin film such that it has a width narrower than the width of the first resist mask;

forming the source and drain regions of the first and second thin film transistors by implanting an impurity of a first conductivity type in the semiconductor layer using the first resist mask and the gate electrode of the first thin film transistor as masks;

removing the first resist mask; and

forming a low density impurity region between the source and drain regions and a channel region of the second thin film transistor by implanting the impurity of the first conductivity type in the semiconductor layer using the processed second metal thin film as a mask.

15. A method of manufacturing a thin film transistor device according to claim 14, comprising the steps of:

forming a gate electrode of a third thin film transistor at the same time when the gate electrode of the first thin film transistor is formed;

forming a second resist mask on the first and second thin film transistors and on the second metal thin film in regions to become a gate electrode of a fourth thin film transistor;

patterning the second metal thin film so as to remove the second metal thin film on the third thin film transistor and on the semiconductor layer in regions to become source and drain regions of the fourth thin film transistor by using the second

resist mask;

forming the source and drain regions of the third and fourth thin film transistors by implanting an impurity of a second conductivity type in the semiconductor layer using the second resist mask as a mask; and

activating the impurities of the first and second conductivity types after removing the second resist mask.

16. A method of manufacturing a thin film transistor device according to claim 14, comprising the step of processing the second metal thin film such that it has a width narrower than the width of the first resist mask after the impurity of the first conductivity type is implanted in the semiconductor layer using the first resist mask.

17. A method of manufacturing a thin film transistor device according to claim 15, comprising the step of forming the low density impurity region of the second thin film transistor by implanting the impurity of the first conductivity type in the semiconductor layer using the second metal thin film as a mask after removing the second resist mask.

18. A method of manufacturing a thin film transistor device according to claim 15, comprising the step of processing the second resist mask on the gate electrode of the fourth thin film transistor such that it has a width narrower than the width of

the gate electrode before the impurity of the second conductivity type is implanted in the semiconductor layer using the second resist mask.

19. A method of manufacturing a thin film transistor device, comprising the steps of:

forming a semiconductor layer having a predetermined configuration on a substrate;

forming a first gate insulation film of first and second thin film transistors on the semiconductor layer;

forming a first metal thin film on the first gate insulation film;

forming a gate electrode of the first thin film transistor by patterning the first metal thin film;

forming a second gate insulation film of the second thin film transistor on the gate electrode of the first thin film transistor;

forming a second metal thin film on the second gate insulation film;

patterning the second metal thin film so as to remove the second metal thin film on the first thin film transistor and on the semiconductor layer in regions to become source and drain regions of the second thin film transistor; and

forming the source and drain regions of the first and second thin film transistors by implanting an impurity of a second conductivity type in the semiconductor layer using the gate

electrode of the first thin film transistor and the patterned second metal thin film as masks.

20. A method of manufacturing a thin film transistor device according to claim 19, comprising the steps of:

forming a gate electrode of a third thin film transistor at the same time when the gate electrode of the first thin film transistor is formed;

forming a resist mask on the first and second thin film transistors and on the second metal thin film in regions to become a gate electrode of a fourth thin film transistor;

patterning the patterned second metal thin film so as to remove the patterned second metal thin film on the third thin film transistor and on the semiconductor layer in regions to become the source and drain regions of the fourth thin film transistor by using the resist mask;

forming a gate electrode of the fourth thin film transistor by processing the second metal thin film patterned further such that it has a width narrower than the width of the resist mask;

forming the source and drain regions of the third and fourth thin film transistors by implanting an impurity of a first conductivity type in the semiconductor layer using the resist mask and the gate electrode of the third thin film transistor as masks;

removing the resist mask;

forming a low density impurity region between the source and drain regions and a channel region of the fourth thin film transistor by implanting the impurity of the first conductivity type in the semiconductor layer using the gate electrode of the fourth thin film transistor as a mask; and

activating the impurities of the first and second conductivity types.

21. A method of manufacturing a thin film transistor device according to claim 20, comprising the step of forming the gate electrode of the fourth thin film transistor by processing the second metal thin film such that it has a width narrower than the width of the resist mask after the impurity of the first conductivity type is implanted in the semiconductor layer using the resist mask.

22. A method of manufacturing a thin film transistor device, comprising the steps of:

forming a semiconductor layer having a predetermined configuration on a substrate;

forming a first gate insulation film of first to fourth thin film transistors on the semiconductor layer;

forming a first metal thin film on the first gate insulation film;

forming gate electrodes of the first and second thin film transistors by patterning the first metal thin film;

forming a second gate insulation film of the third and fourth thin film transistors on the gate electrodes of the first and second thin film transistors;

forming a second metal thin film on the second gate insulation film;

forming a first resist mask on the second metal thin film;

patterning the second metal thin film so as to remove the second metal thin film on the first and second thin film transistors and on the semiconductor layer in regions to become source and drain regions of the third and fourth thin film transistors using the first resist mask;

forming gate electrodes of the third and fourth thin film transistors by processing the second metal thin film such that it has a width smaller than the width of the first resist mask;

forming the source and drain regions of the first and third thin film transistors by implanting an impurity of a first conductivity type in the semiconductor layer using the first resist mask and the gate electrodes of the first and second thin film transistors as masks;

removing the first resist mask; and

forming a low density impurity region between the source and drain regions and a channel region of the third thin film transistor by implanting the impurity of the first conductivity type in the semiconductor layer using the gate electrode of the third thin film transistor as a mask.

23. A method of manufacturing a thin film transistor device according to claim 22, comprising the steps of:

forming a second resist mask for covering the first and third thin film transistors;

forming source and drain regions of the second and fourth thin film transistors by implanting an impurity of a second conductivity type in the semiconductor layer using the second resist mask; and

activating the impurities of the first and second conductivity types after removing the second resist mask.

24. A method of manufacturing a thin film transistor device according to claim 22, wherein the impurity of the first conductivity type is implanted in the semiconductor layer to become the source and drain regions of the second and fourth thin film transistor when the source and drain regions of the first and third thin film transistors and the low density impurity region are formed.

25. A method of manufacturing a thin film transistor device according to claim 22, comprising the step of:

processing the second metal thin film such that it has a width narrower than the width of the first resist mask after the impurity of the first conductivity type is implanted in the semiconductor layer using the first resist mask.

26. A method of manufacturing a thin film transistor device according to claim 23, comprising the step of forming a low density impurity region of the third thin film transistor by implanting the impurity of the first conductivity type in the semiconductor layer using the second metal thin film as a mask after removing the second resist mask.